CONCERNING THE CLINICO-EEG CHARACTERISTICS OF CEREBELLAR NEOPLASMS IN CHILDHOOD

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The physiological peculiarities of developing brain and the higher frequency of cerebellar neoplasms in childhood compel a complex clinical and EEG follow-up in good time (1—5). The actuality of this diagnostic problem (1, 3, 6, 7) warrants us to sum up our experience with a view to early diagnosing of the type and prognosticating in the preoperative period of cerebellar neoplasms.

Material and methods

We have analysed 50 observations of children aged between 1 and 15 years with proved tumours in the posterio-cranial fossette (PCF).The children were examined clinically and electroencephalographically and followed-up at an average for 6 months till 2 years. The expansive process was sagittally located in 30 of them and it occupied the cerebellar hemispheres in the rest 20 ones. Histologically, 15 neoplasms were benign and 35 were malignant glial tumours. The recording of bioelectrical activity (BEA) was carried out by using a 16 channel EEG apparatus "Schwartzer" at patients' hospitalization in the course of clinical examination and in the postoperative period.

Results and discussion

The sagittal tumours showed an increase of hypertensive manifestations in the development of clinical picture. A local symptomatics of cerebellar hemispheres appeared after the 3rd month. We observed meningeal syndromes in half of the patients. In 8 of them the vomit was a local phenomenon which was due to the tumour growth into the IVth ventricle as proved operatively. The brain stem symptoms began to predominate quite later — between 3 and 6 months after initial clinical signs. Arranged to their frequency they are nystagm, unilaterally lowered corneal reflex, bilateral hypotony of striated musculature and ataxia of lower extremities, ocular paralyses, anisocoria and disorder of convergence. Only in 3 cases we established focal symptomatics which originated from caudal regions of the brain stem with lesion of the functions of both IXth and Xth craniocerebral nerves. In 8 patients we found out signs of inclination of cerebellar tonsils and paresis of the VIth craniocerebral nerve as distant phenomenon. BEA changes of sagittal tumours were characterized with predominating teta- and delta-waves and localization mainly in occipital lobes of both hemispheres. Periodically, a distant synchronization of rhythms with slow-wave character was established. According to EEG follow-up the declination of children's health showed parallel increase of diffuse changes of highvoltage teta- and delta-waves forming frequent discharges and amplitude markedness of occipital leads. The

cerebellar hemisphere tumours demonstrated following local phenomena: muscular hypotony at the side of damaged hemisphere, predominating coordination disorders, and later on stato-kinetic disturbances and involvement of the Vth craniocerebral nerve. Usually, initial symptoms were an expression of increased intracranial pressure. Only in 6 patients the cerebellar tumours commenced with ataxic syndrome and bend of the head to the opposite side of the tumour.

At decompensation stage one can feel an expressed neck rigidity, respiratory and cardiac rhythm disorders, involvement of caudal craniocerebral nerves and bilateral lack of corneal reflex. On the background of more or less expressed general-brain manifestations BEA was characterized with local teta- and delta-wave deviations in occipital, temporal and, more rarely, frontal homo- and controlateral regions. The appearance of EEG discharges of edged teta- and single delta-waves testified a dysfunction of the sagittal cerebral structures. The disappearance of these pathologic forms in occipital lobes during photostimulation showed their distant origin.

A slow progressive course of local and general-brain clinical phenomena corresponding to the degree of expressiveness of internal hydrocephalia was ascertained in benign neoplasms. On the other hand, medulloblastomas were characterized with rapid brain stem decompensation and slightly expressed signs of increased intracranial pressure. These data were supported by the finding that the mean period from the present clinical phenomena till the surgical verification of benign neoplasms was between 1 and 2 years long. In the majority of these cases the disease took a remittent course while the aforementioned stage of malignant neoplasms was shortened to approximately 6 months only.

It is a noteworthy fact that EEG changes depend not on the character of expansive processes in PCF but on their stage of development. If there are rough clinical hypertensive events and symptoms of involvement of brain stem formations in the pathologic process, the EEG recording shows diffuse high-amplitude slow-wave activity and frequent bilateral discharges independently of the character of the tumour and age of the patient.

The summarized data from dynamic clinical-EEG studies of cerebral neoplasms demonstrate the higher frequency of the sagittal tumours which grow towards the ventricular system. Similar results are reported by other investigators (1, 5, 6 and oth.). The general-brain clinical manifestations dominate in both benign and malignant sagittal neoplasms. In concordance with other studies (2—4) EEG demonstrates, in parallel to clinical symptomatics, an outlined expressiveness of slow-wave elements in occipital zones and a tendency to paroxysmal synchronization independently of the localization of cerebellar tumours. The slow-wave amplitudes and high-voltage delta-discharges increase when patient's state is taking a turn for the worse in the preoperative period. These EEG indices are interpreted as functional involvement of median brain structures at mesdiencephalic level in the pathologic process (2, 4).

The dynamic clinical and EEG follow-up tends to an increase of mean duration between the appearence of initial symptoms till the forming of signs of increased intracranial pressure in cases with benign neoplasms in contrast to malignant ones. The lateralization of focal EEG changes of the opposite hemisphere can be related to the neurodynamic influence of afferent connections with cerebral hemispheres. The evaluation of clinical and dynamic EEG changes in the preoperative period demonstrates the severity of damage of brain stem structures and prognosticates the outcome of the operative treatment of cerebellar tumours.

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О КЛИНИКО-ЭЭГ ХАРАКТЕРИСТИКЕ ОПУХОЛЕЙ МОЗЖЕЧКА В ДЕТСКОМ ВОЗРАСТЕ

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РЕЗЮМЕ

Авторами анализируется динамика клинических и ЭЭГ изменений у 50 больных опухолями мозжечка в возрасте от 1 года от 15 лет. При топике неоплазмы разделяются на занимающие среднюю линию и латерализированные — доброкачественного и злокачественного характера. Обобщенные данные показывают большую частоту опухолей на средней линии с прорастанием к вентрикулярной системе и с клиническими проявлениями внутричерепной гипертензии. Параллельно с ведущим неврологическим синдром ЭЭГ дает выраженные медленноволновые элементы в затылочных отделах мозга и показывает склонность к приступной синхронизации. Эти данные оцениваются как функциональное вовлечение в патологический процесс средних структур головного мозга на мезодиенцефальном уровне и предлагают прогностические критерии исхода с применением оперативного лечения опухолей мозжечка.